

An Analysis of Forewing Patterns in Lepidoptera

Richard L. Brown

Mississippi Entomological Museum

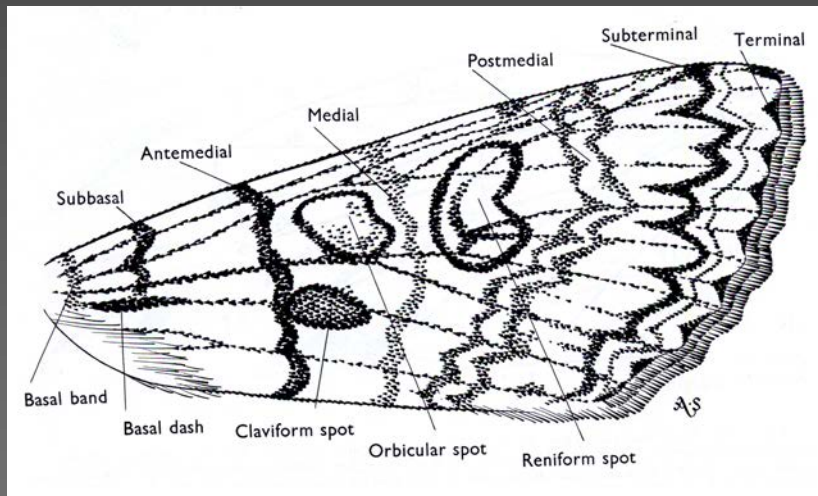
Mississippi State University, USA

Joaquin Baixeras

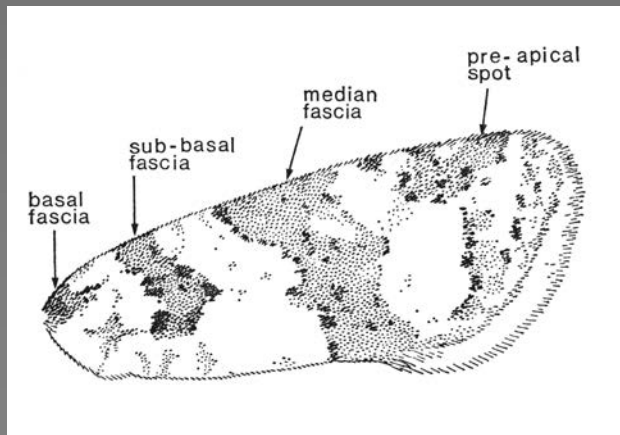
Cavanilles Institute of Biodiversity and Evolutionary Biology

University of Valencia, Spain

The Problem of Homology of Fasciae and other Pattern Elements



Noctuidae (Zimmerman, 1978)



Tortricidae (Bradley et al, 1973)

Different terminology in different families

+

Different terminology in same family by different authors

=

No comparative or phylogenetic value

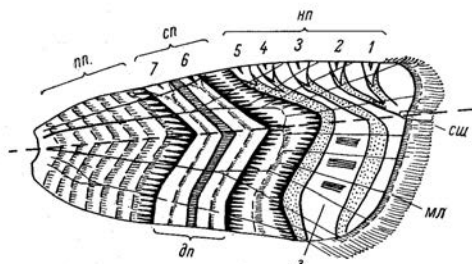
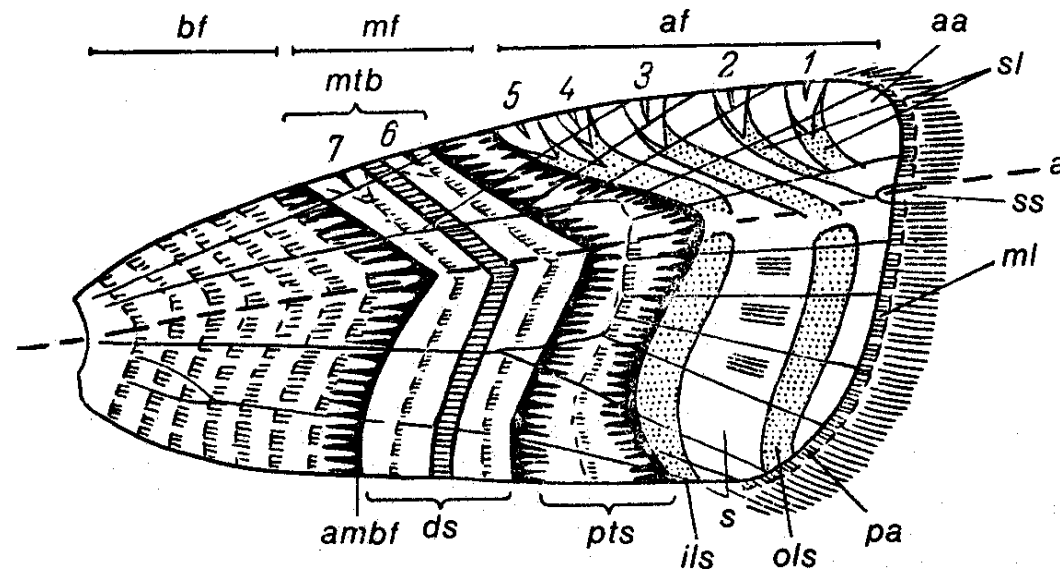


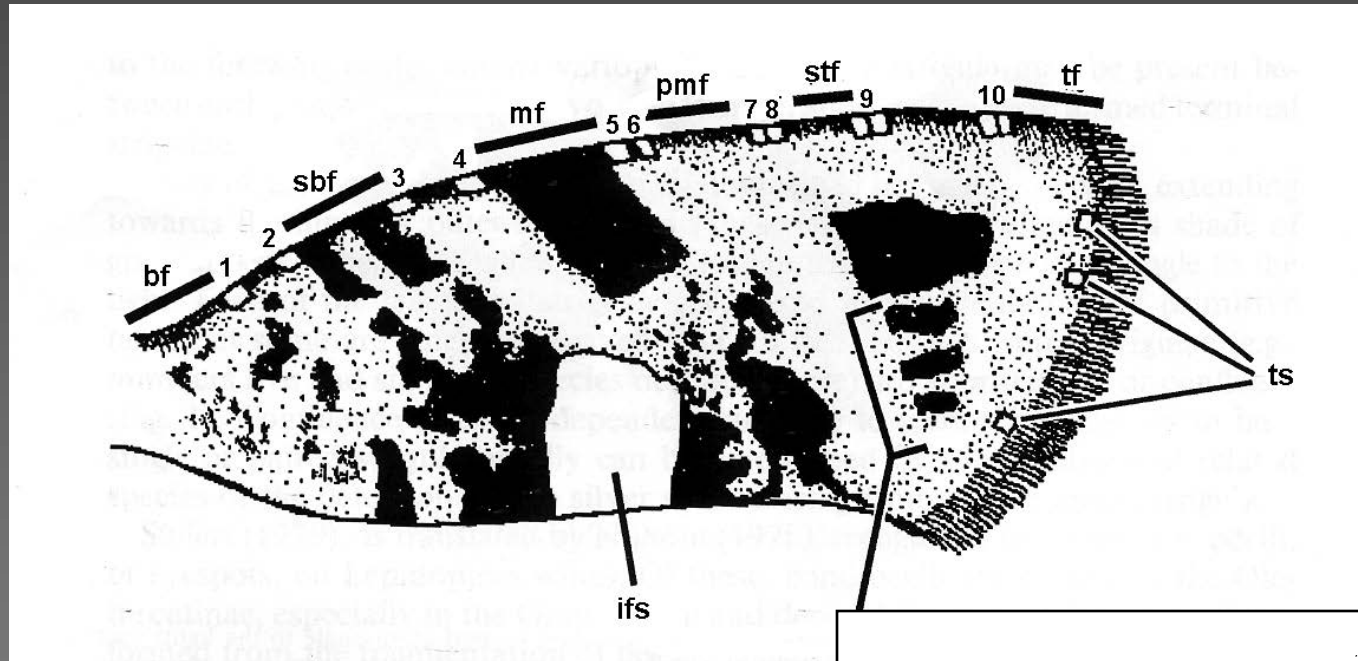
Рис. 6. Схема рисунка переднего крыла *Laspeyresini*.
 1—5 — предвершинные костальные штрихи и отходящие от них
 металлические линии; 6—7 — костальные основания линий
 срединной перевязи; нп — прикорневое, сп — срединное и
 мл — наружное поле; дп — область дорсального пятна; 3 —
 зеркальце; мл — маргинальная линия; сш — субапикальная
 выемка и светлый штрих. Штрихом показано направление
 продольной оси крыла.

Danilevsky & Kuznetsov 1968

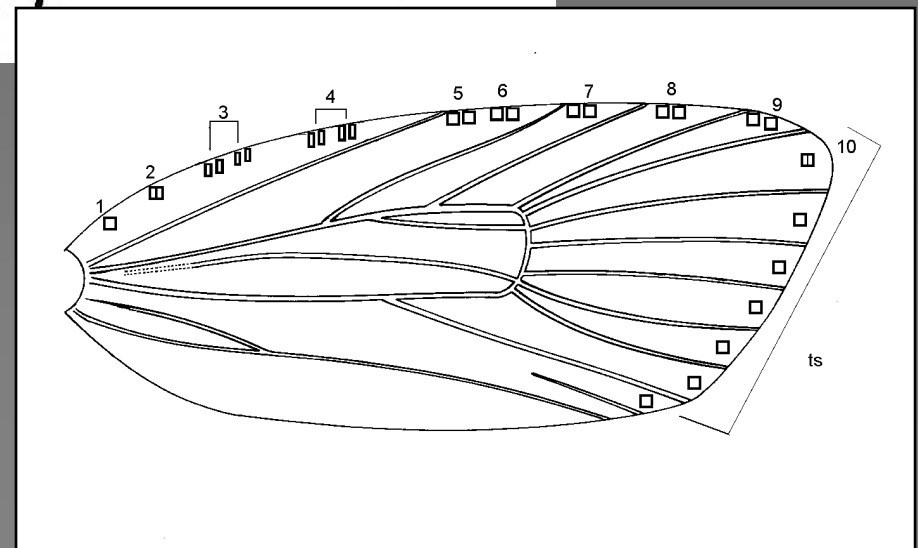
Kuznetsov 1978
 (English translation 1987)

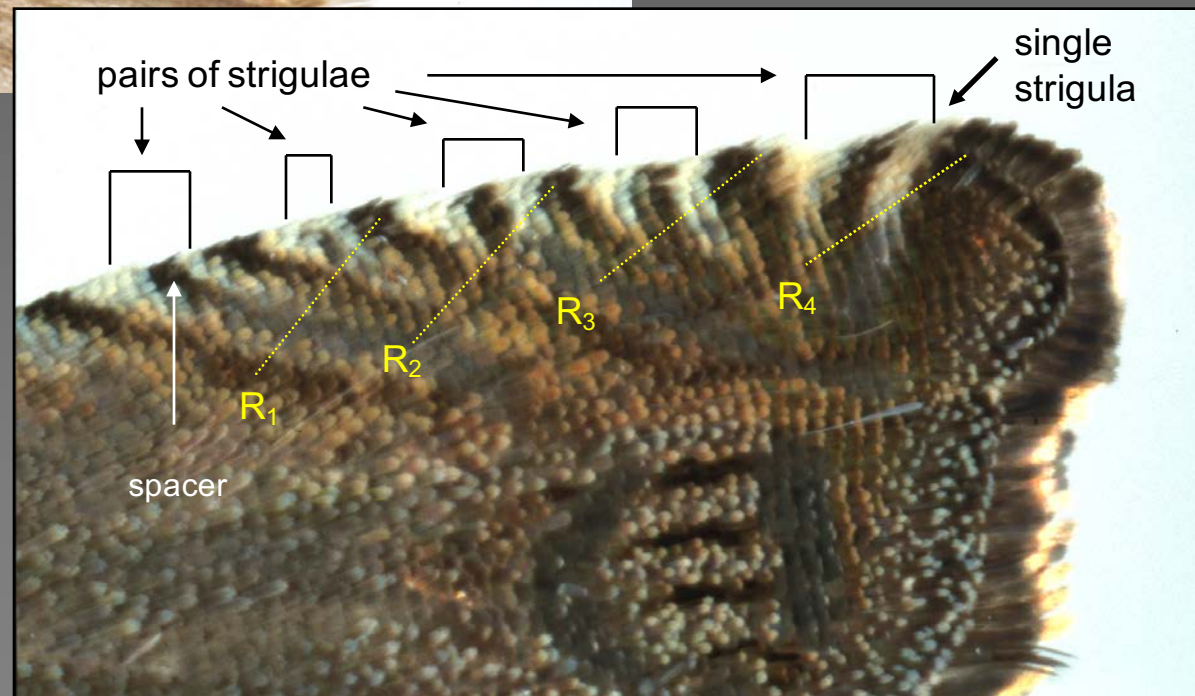
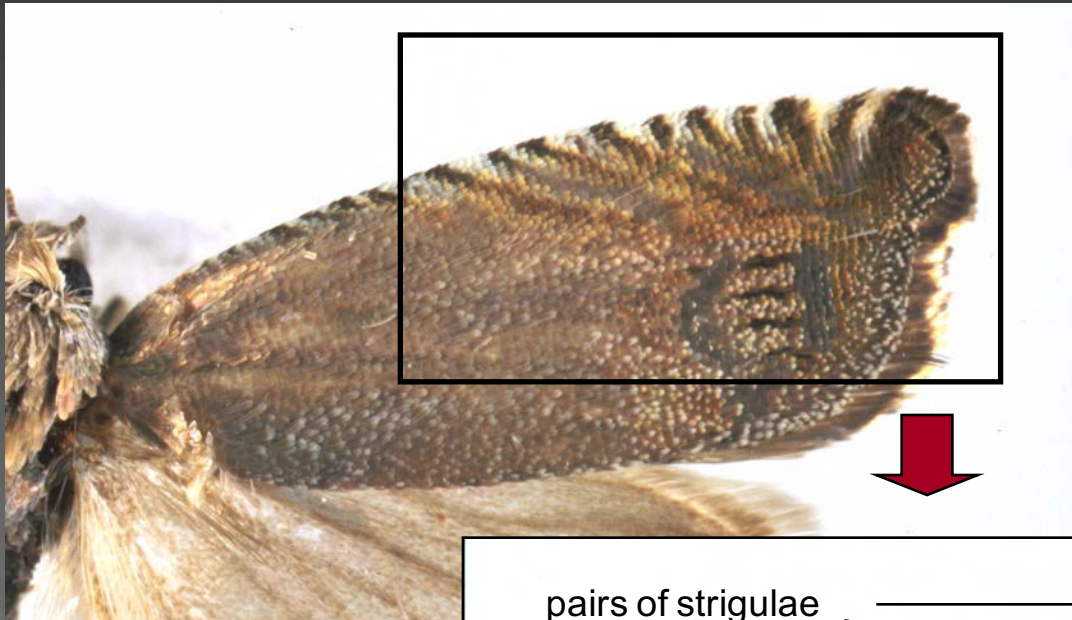


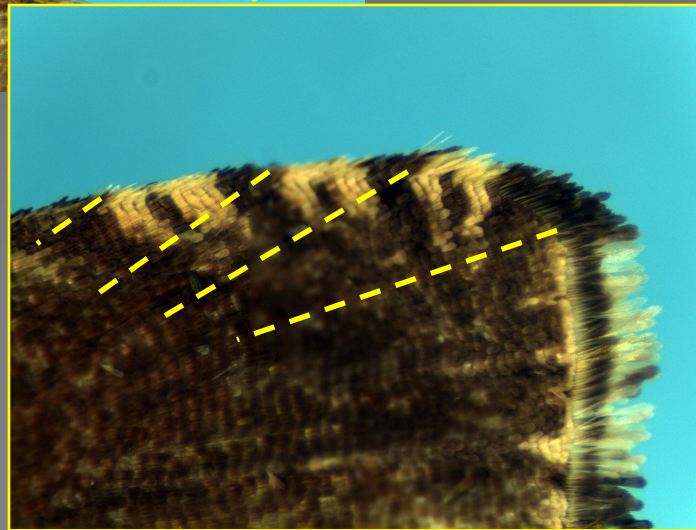
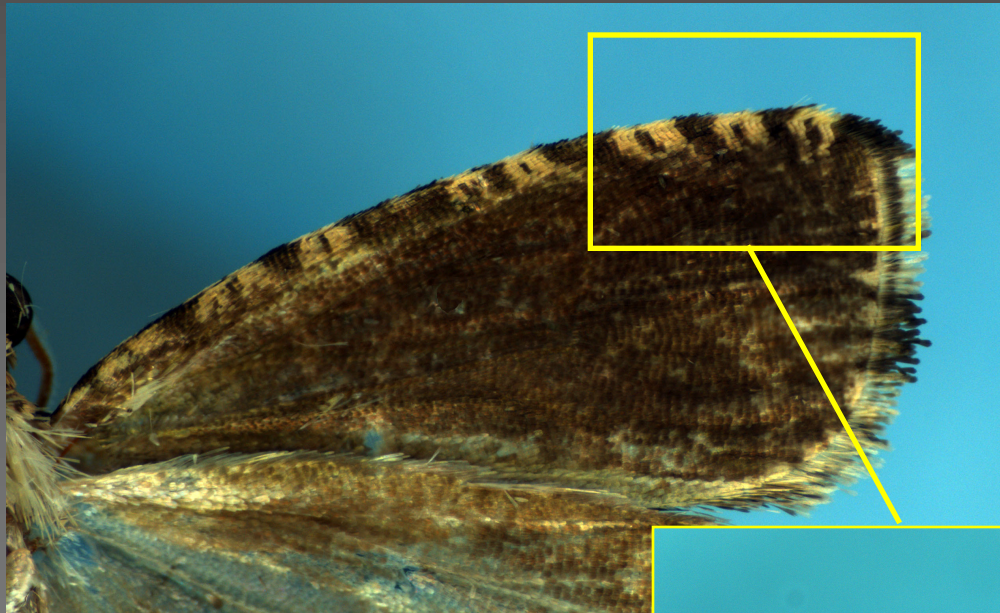
Brown & Powell 1991



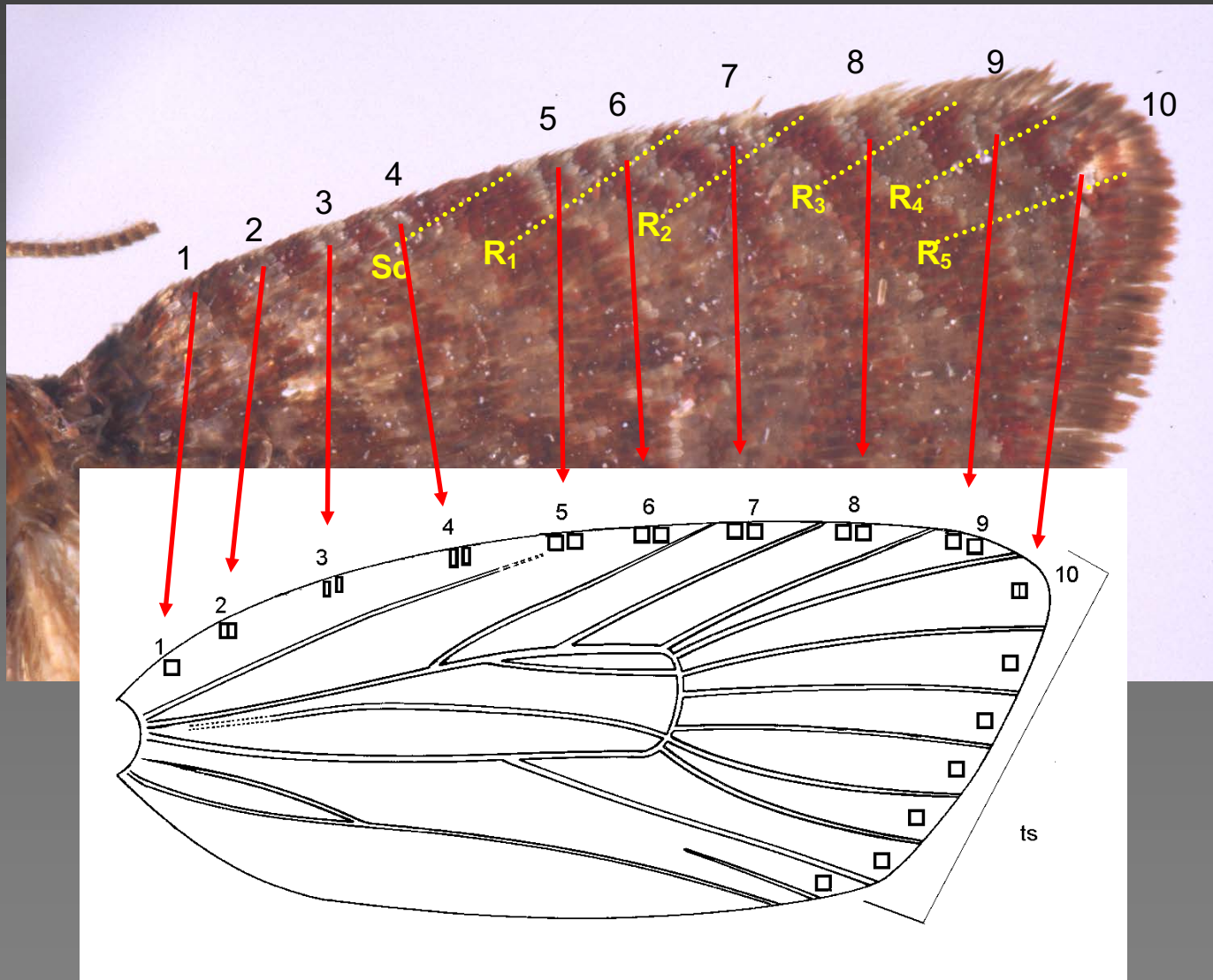
Baixeras 2002

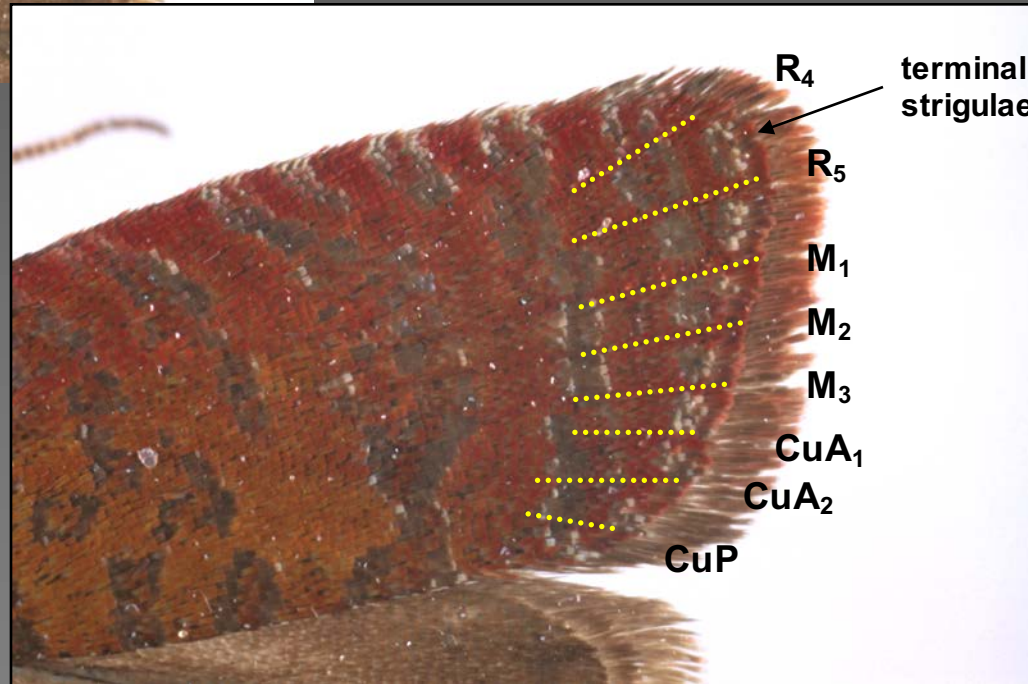


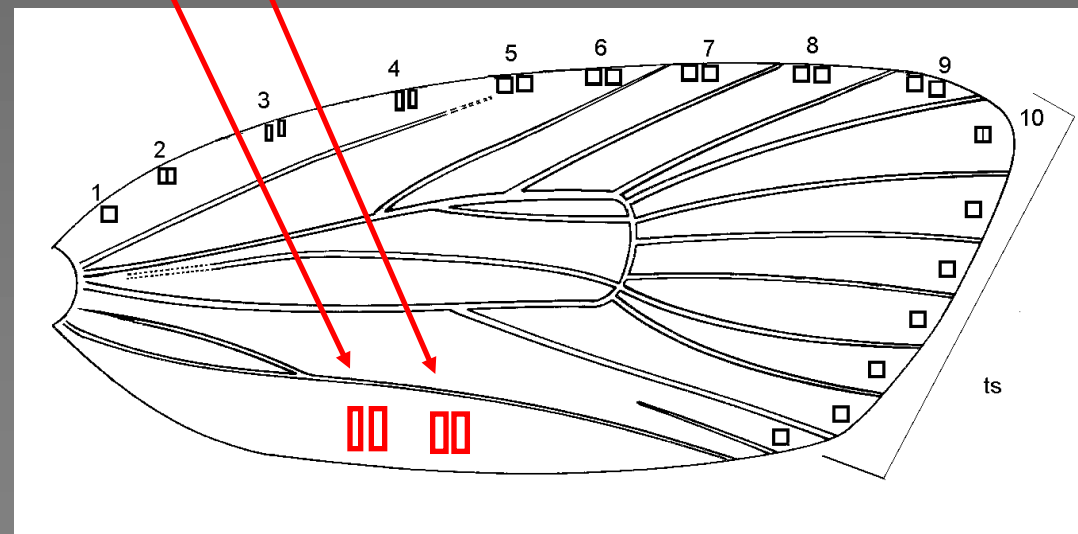


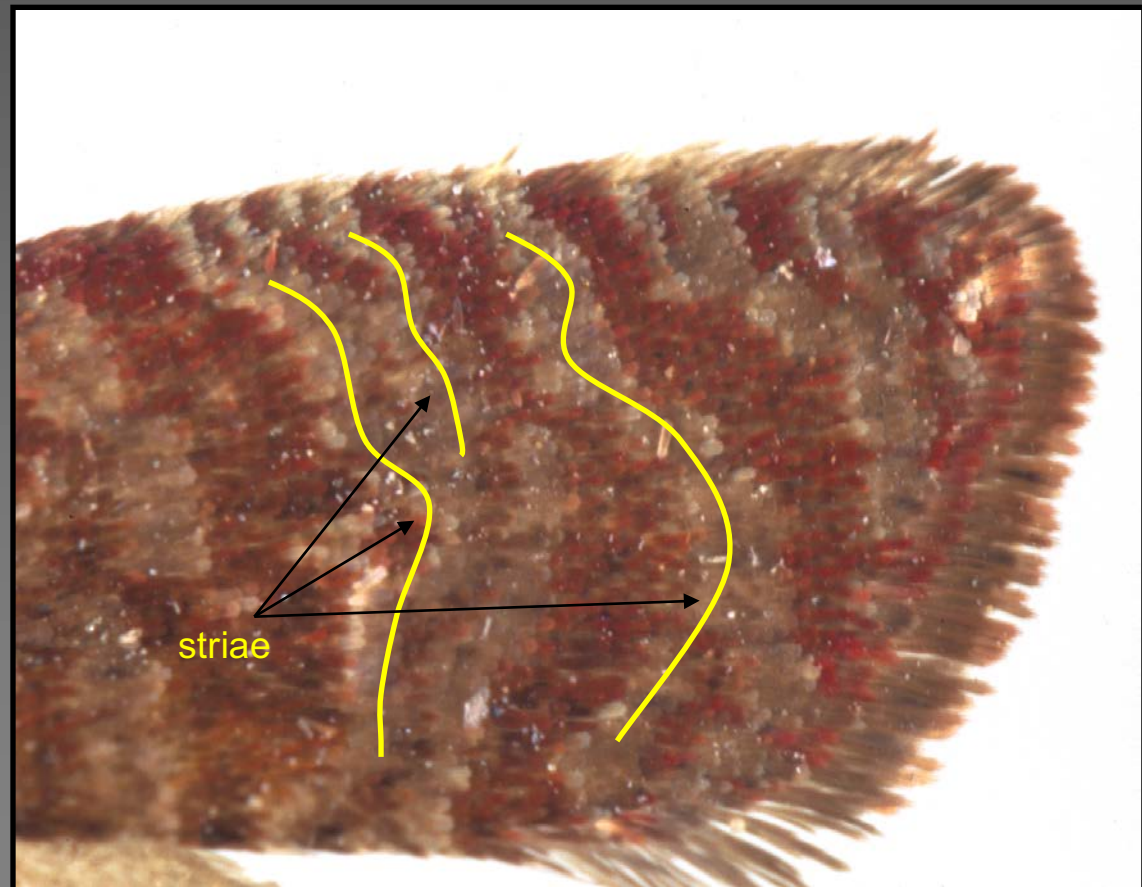


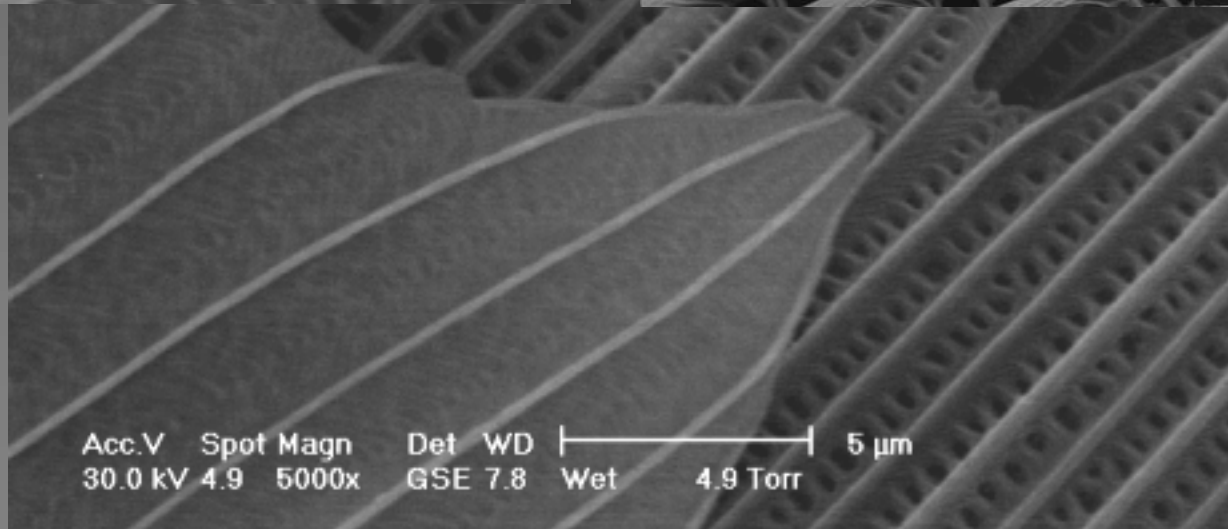
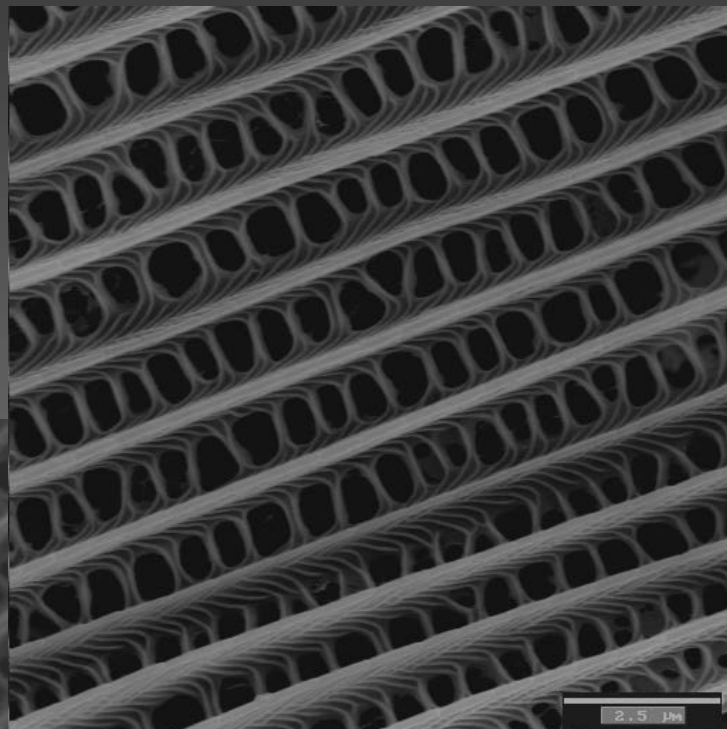
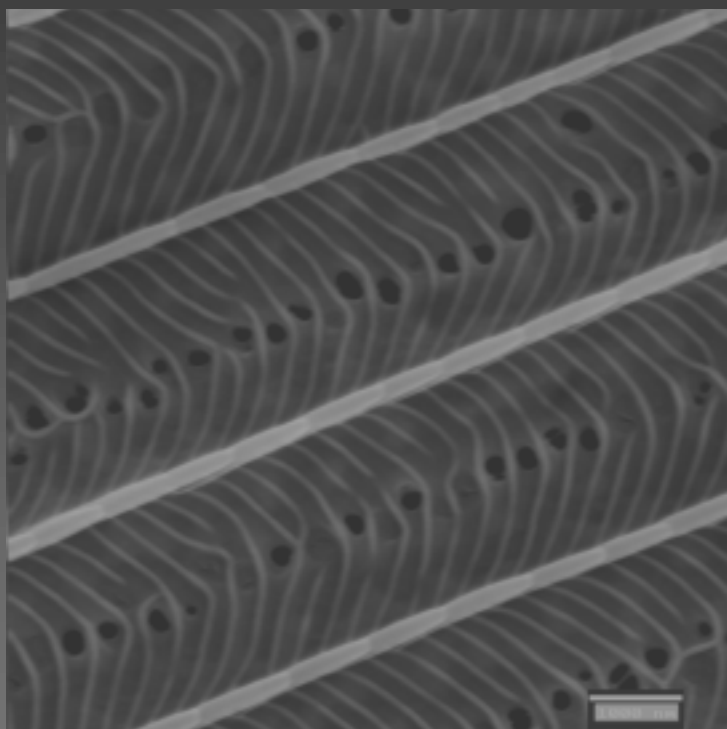
Underside







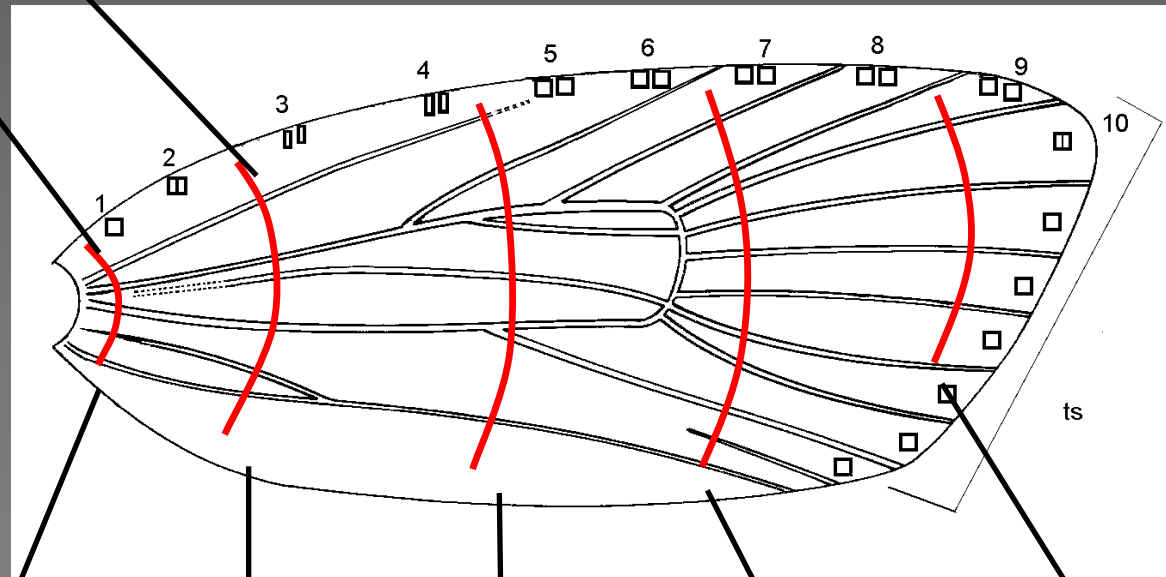




Acc.V Spot Magn Det WD |-----| 5 μ m
30.0 kV 4.9 5000x GSE 7.8 Wet 4.9 Torr



Fasciae



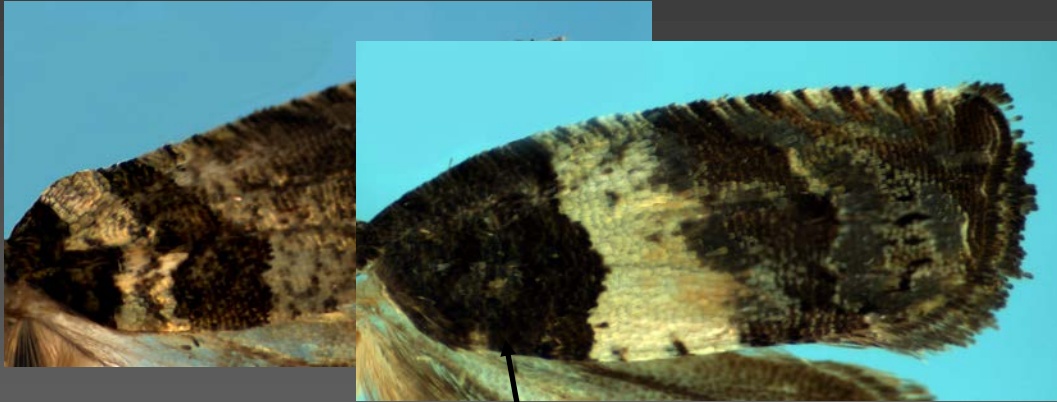
Basal

Subbasal

Median

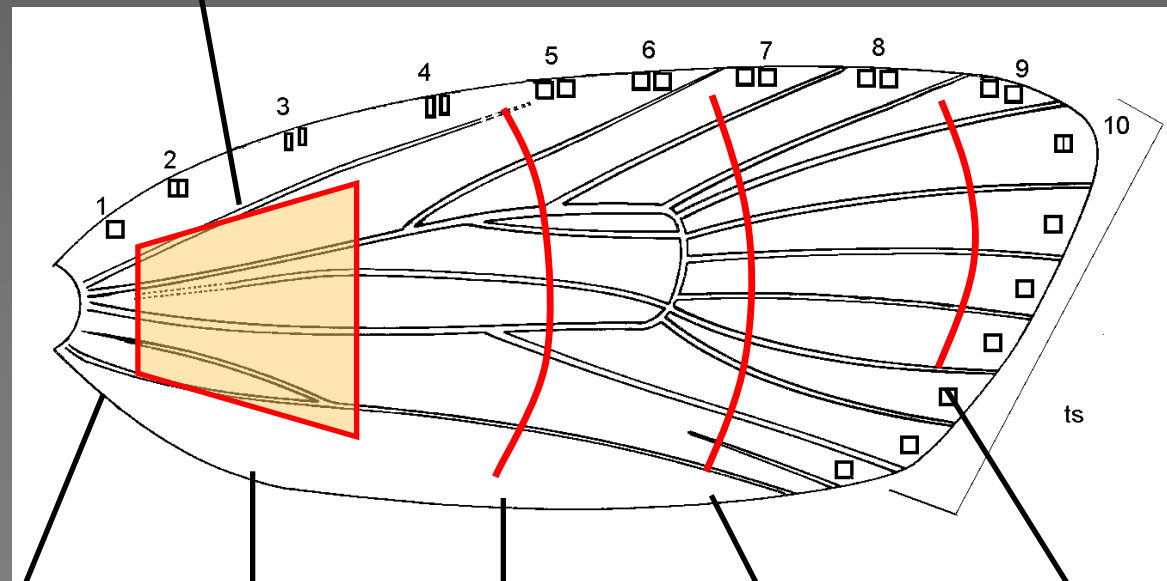
Postmedian

Preapical



**Progressive
effect of
suffusion**

Fasciae



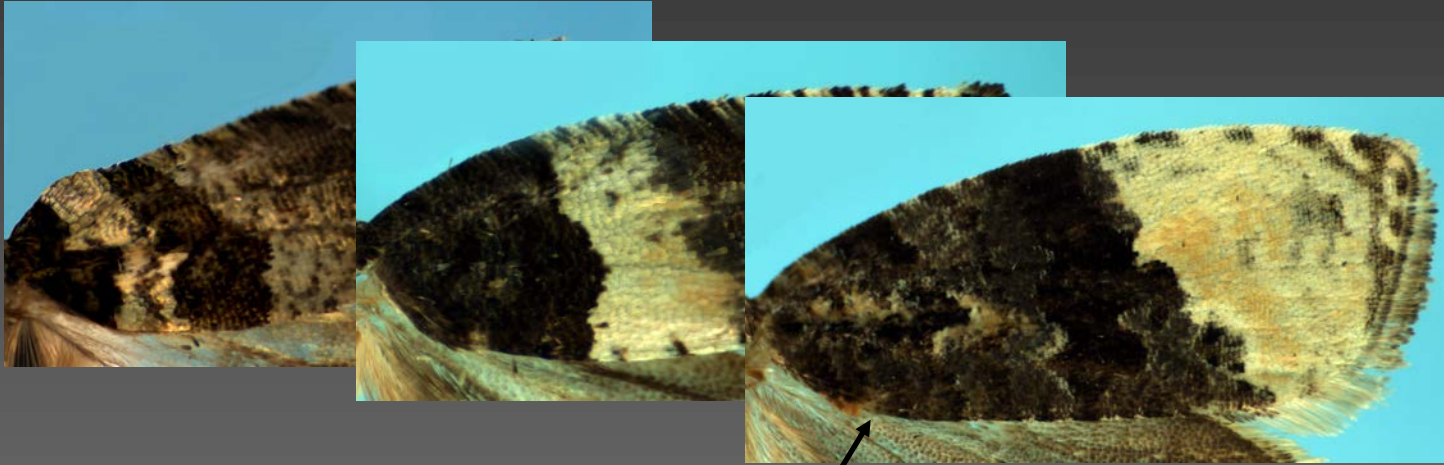
Basal

Subbasal

Median

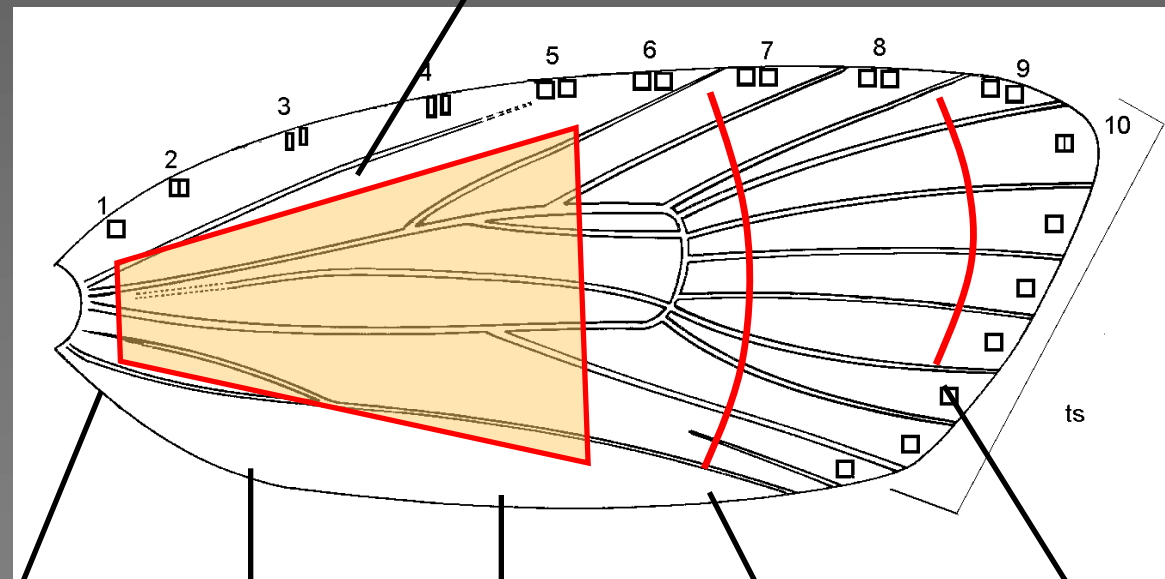
Postmedian

Preapical



**Progressive
effect of
suffusion**

Fasciae



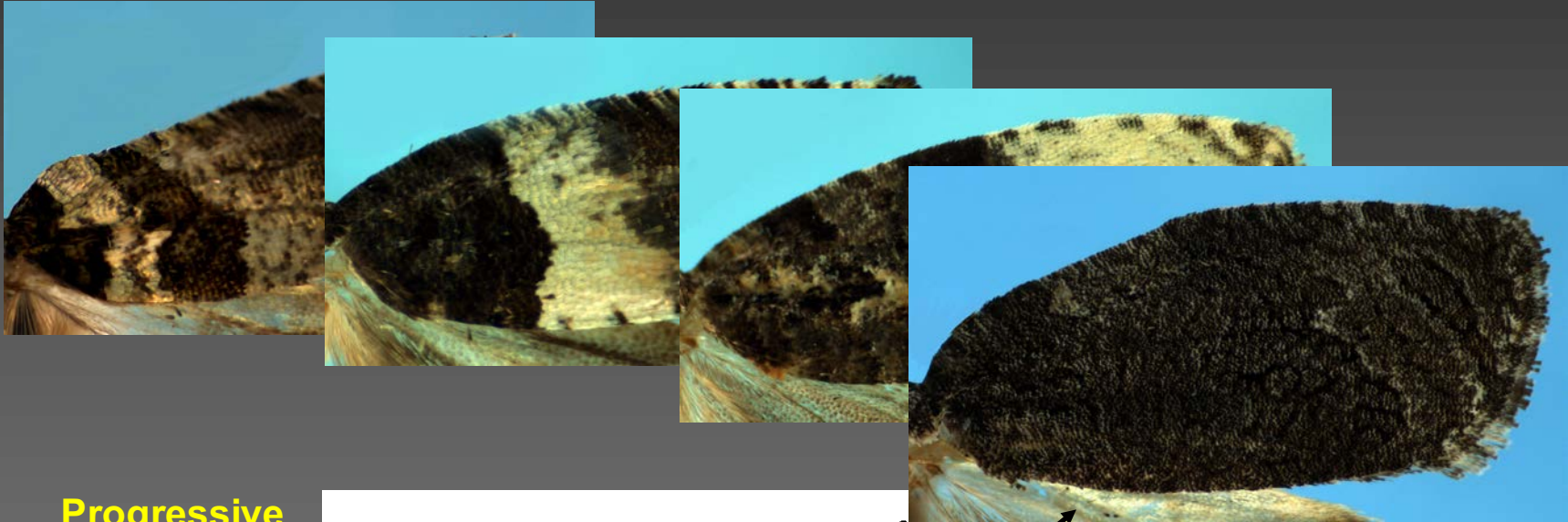
Basal

Subbasal

Median

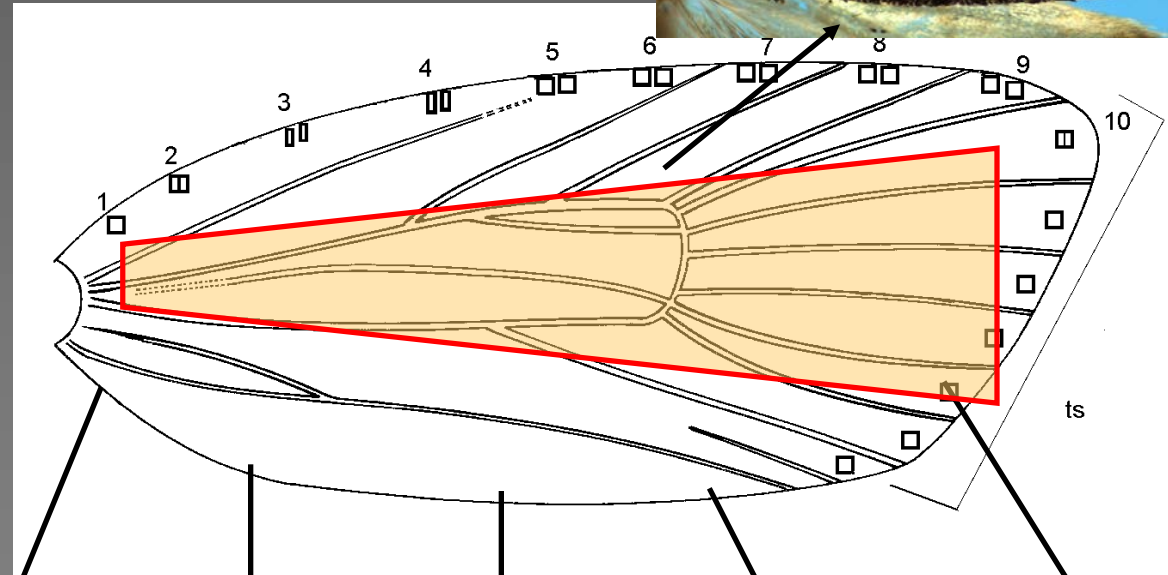
Postmedian

Preapical



**Progressive
effect of
suffusion**

Fasciae



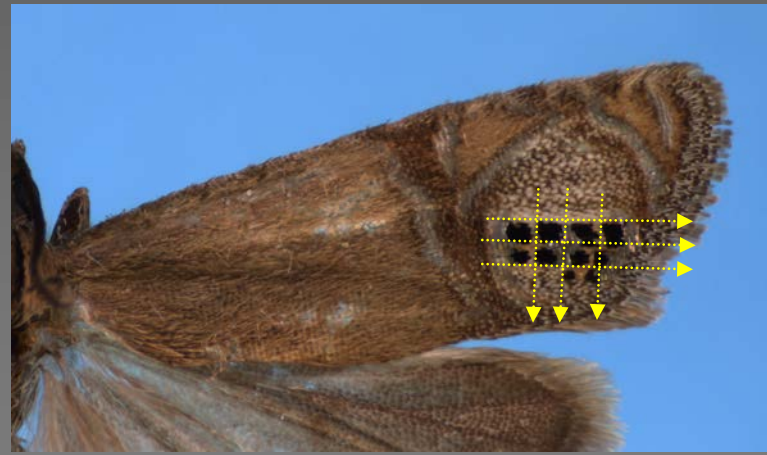
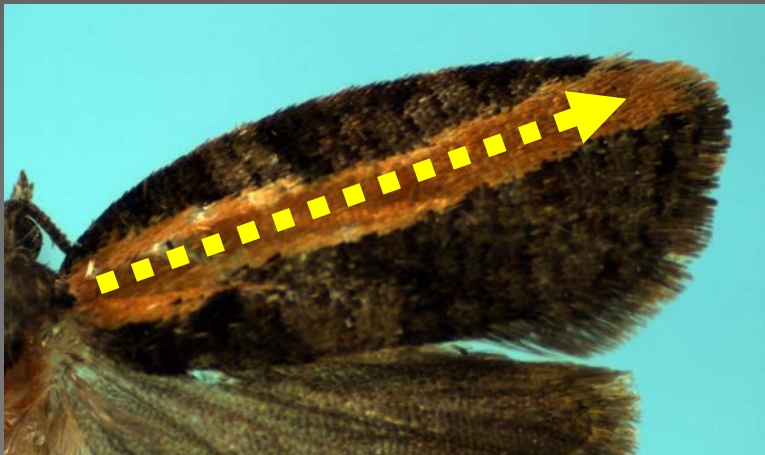
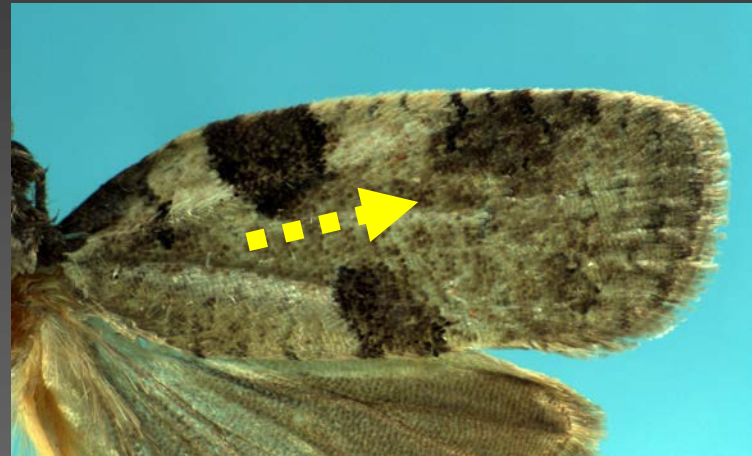
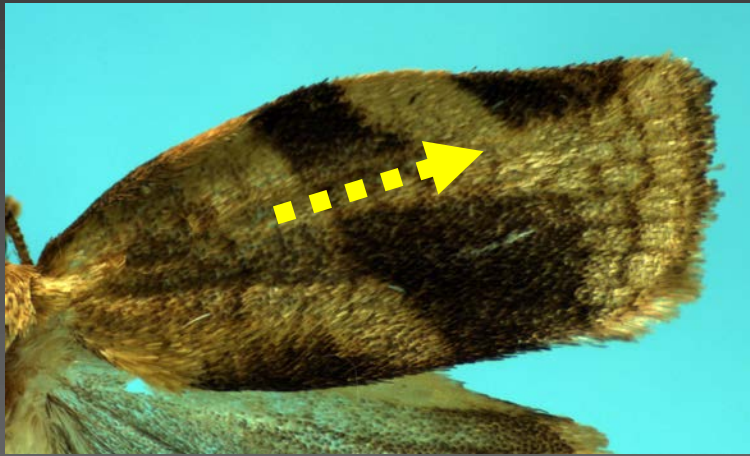
Basal

Subbasal

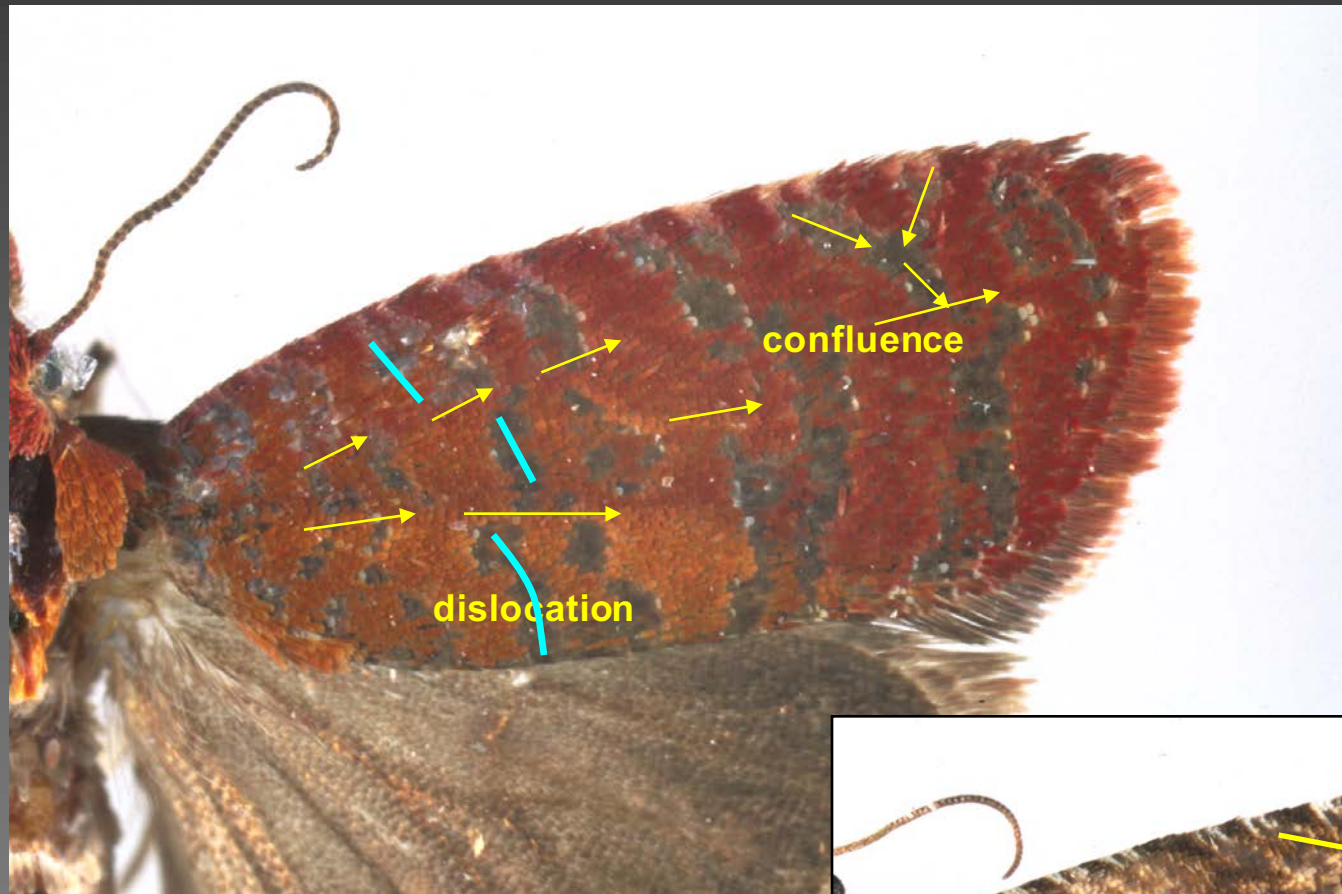
Median

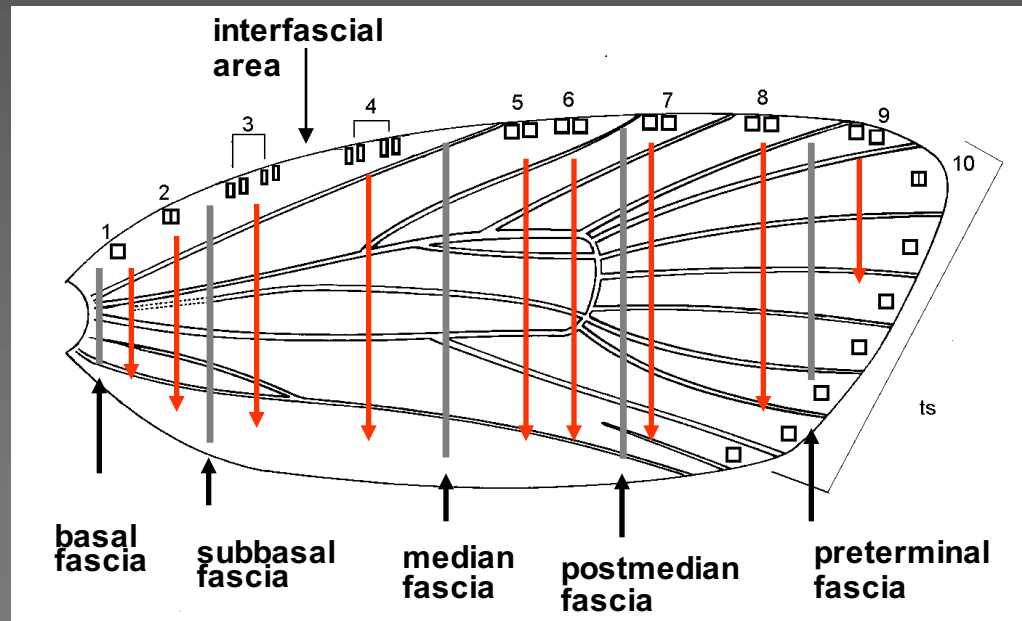
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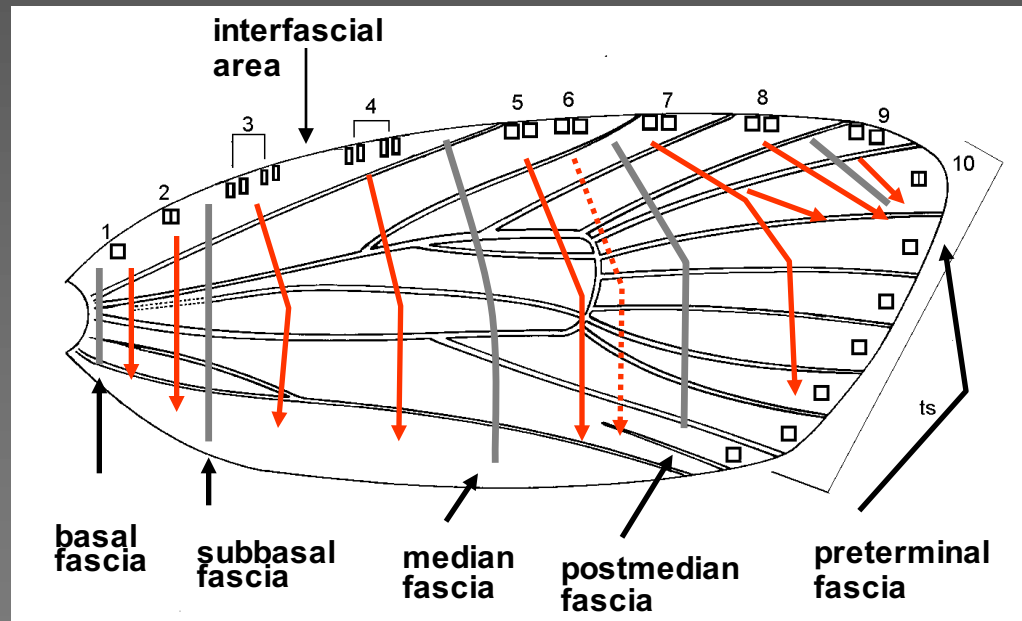
Preapical

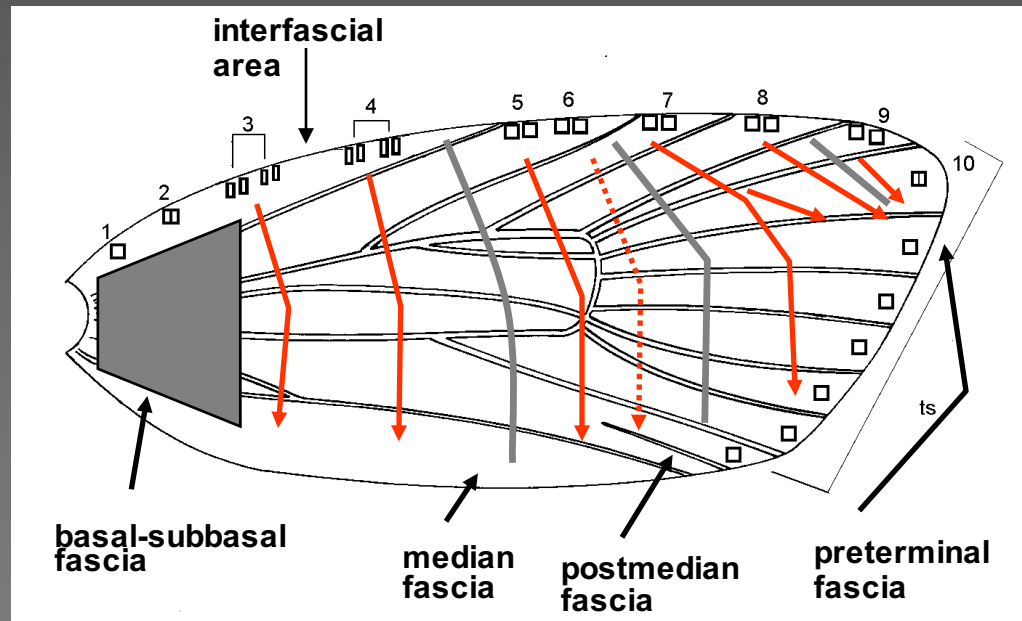


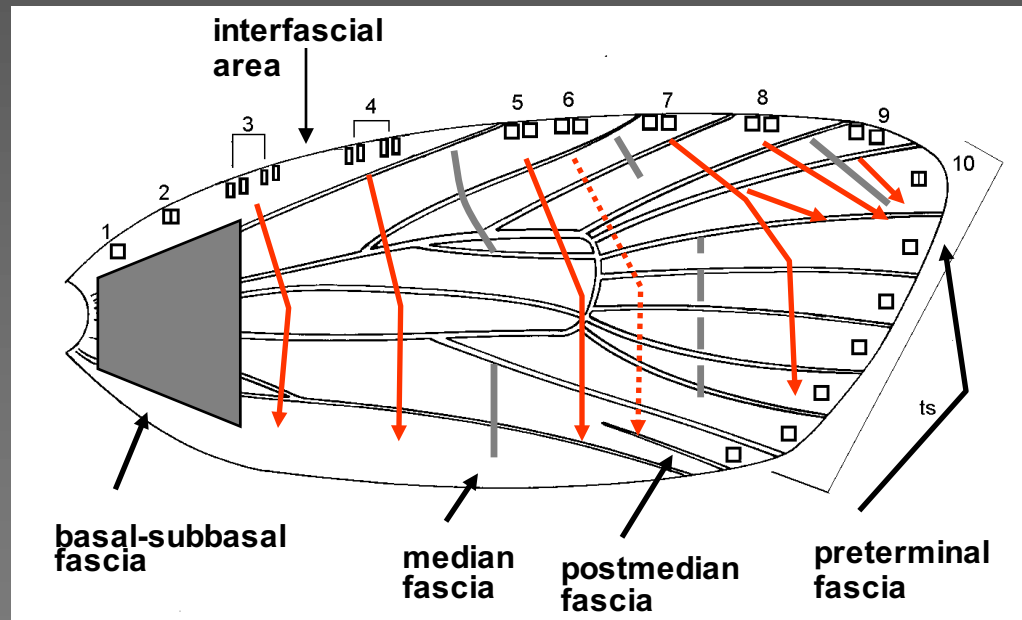
Fragmentation



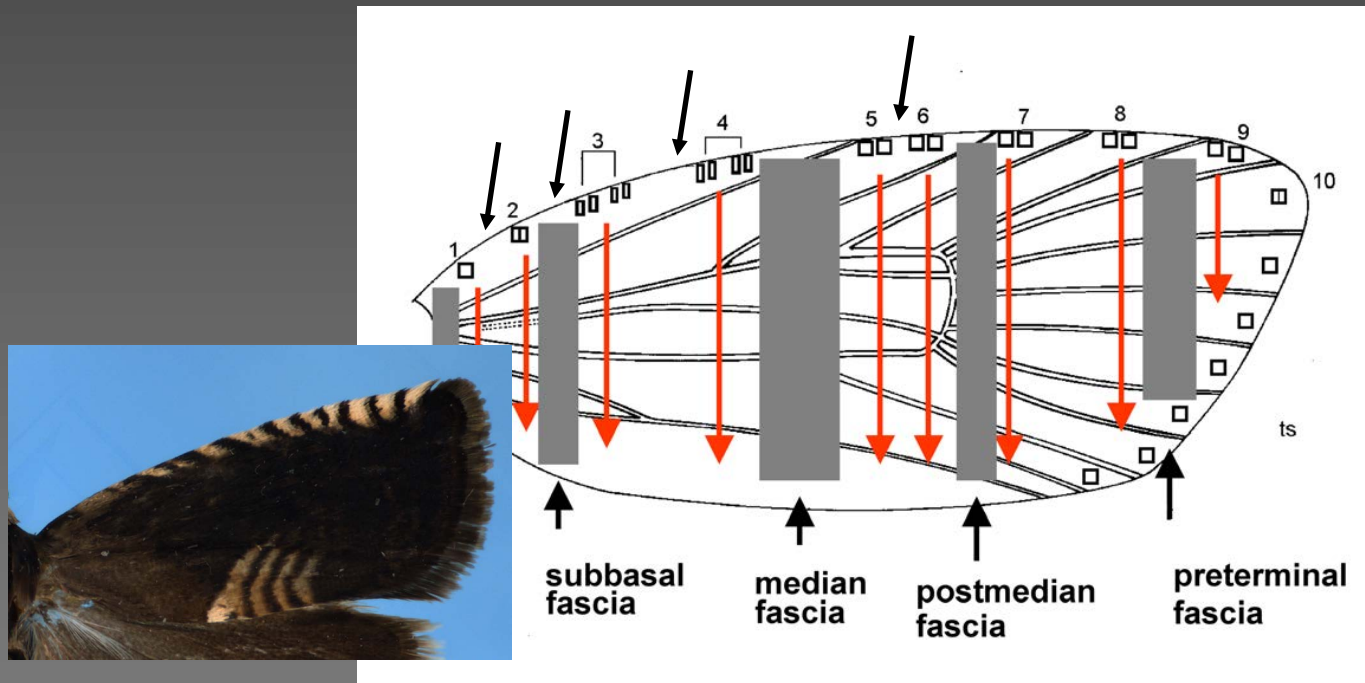








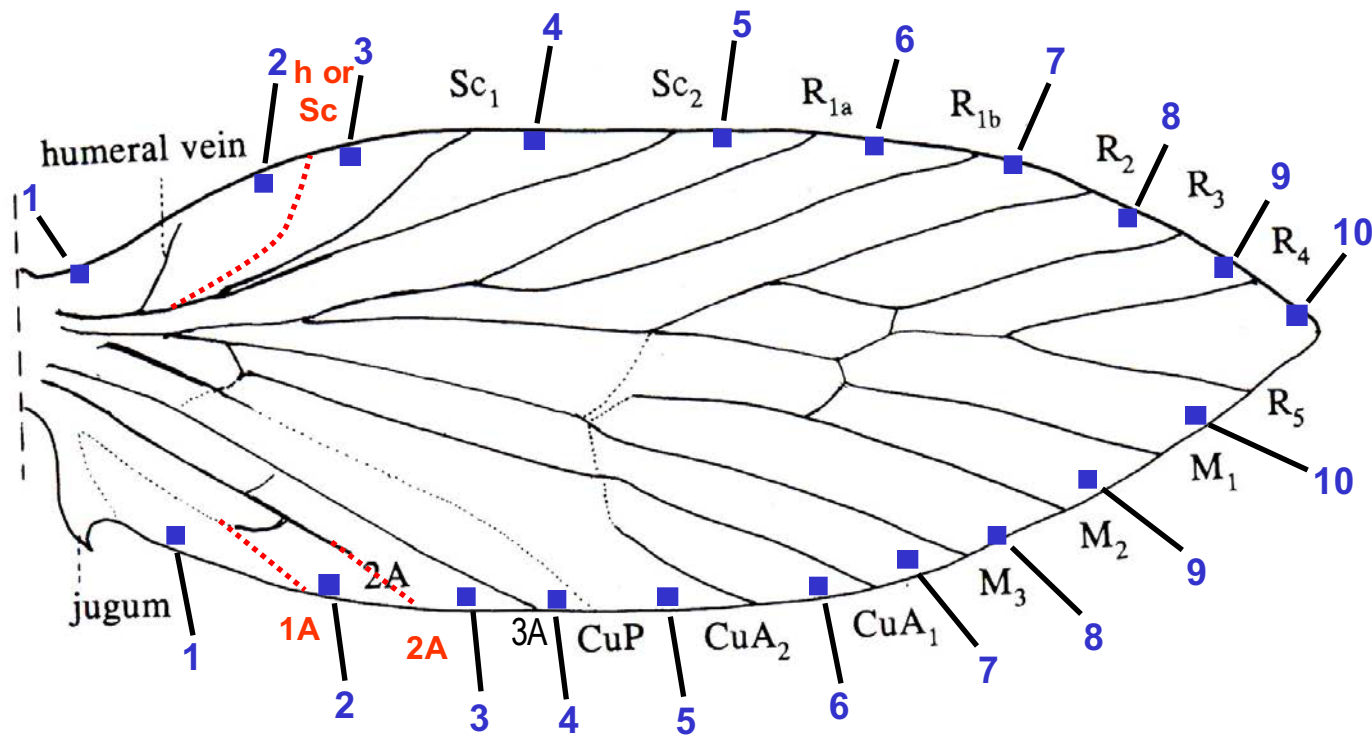
Strigulae 1-10 are foci for determining the position of five transverse fasciae on the forewing.



Does the absence of veins between some strigulae (foci) indicate loss of ancestral veins?

Are strigulae (foci) present on the wing dorsum?

Primitive Wing Venation of Micropterigidae



Sabatinca sp. (Micropterigidae). Adapted from Scoble, 1992

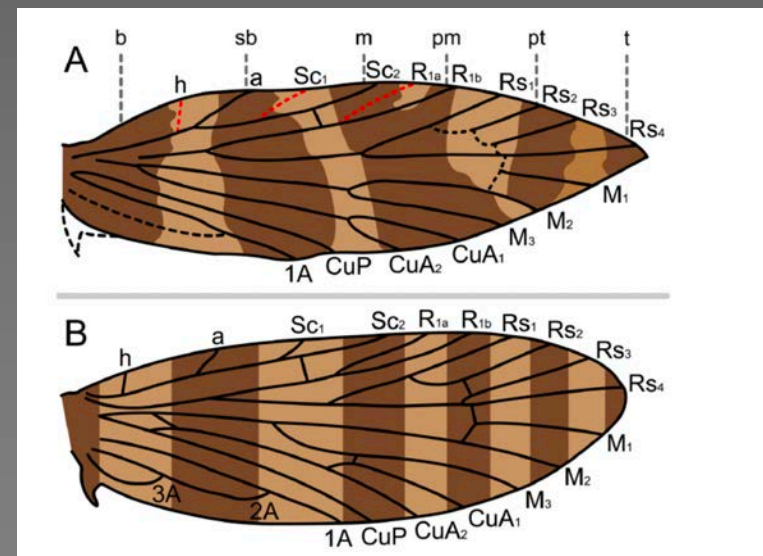
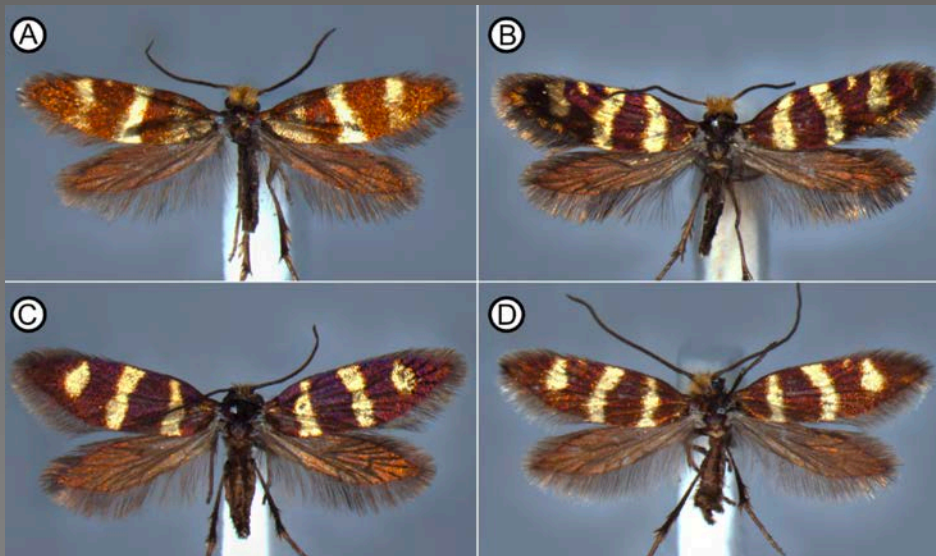
Application of Tortricid Model to Micropterigidae - *Micropterix*

PLOS ONE

RESEARCH ARTICLE

Color Pattern on the Forewing of *Micropterix* (Lepidoptera: Micropterigidae): Insights into the Evolution of Wing Pattern and Wing Venation in Moths

Author: P. Schatzel, R. P. Schatzel, R. P. Schatzel, R. P. Schatzel



Application of Tortricid Model to Micropterigidae - *Satatinca*

Schachat and Brown *BMC Evolutionary Biology* (2016) 16:116
DOI 10.1186/s12862-016-0687-z

BMC Evolutionary Biology

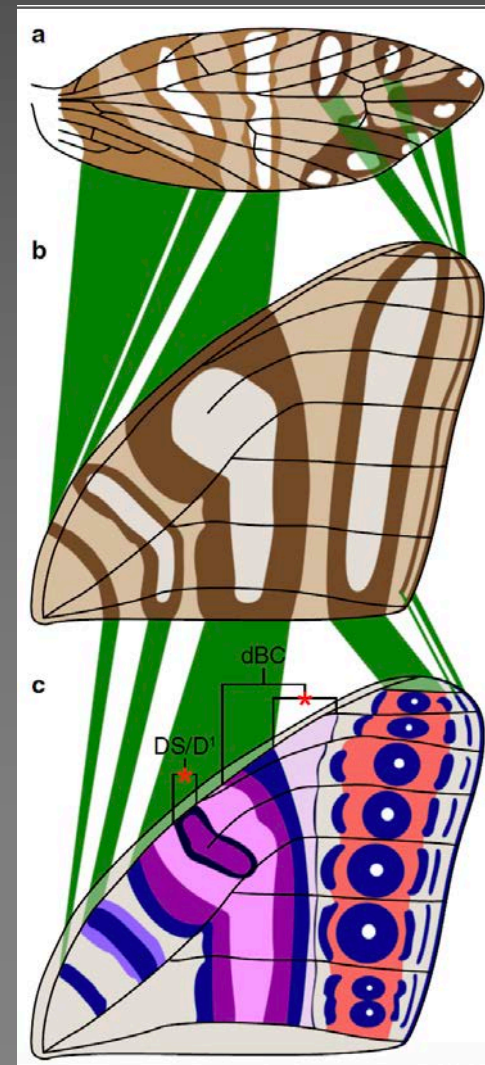
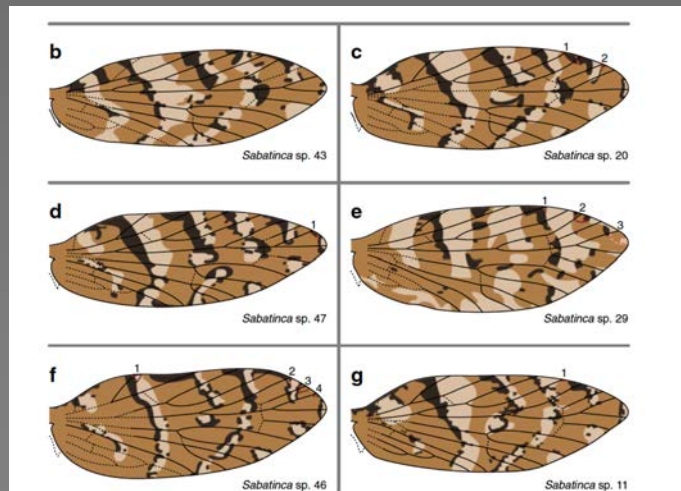
RESEARCH ARTICLE

Open Access



Forewing color pattern in Micropterigidae (Insecta: Lepidoptera): homologies between contrast boundaries, and a revised hypothesis for the origin of symmetry systems

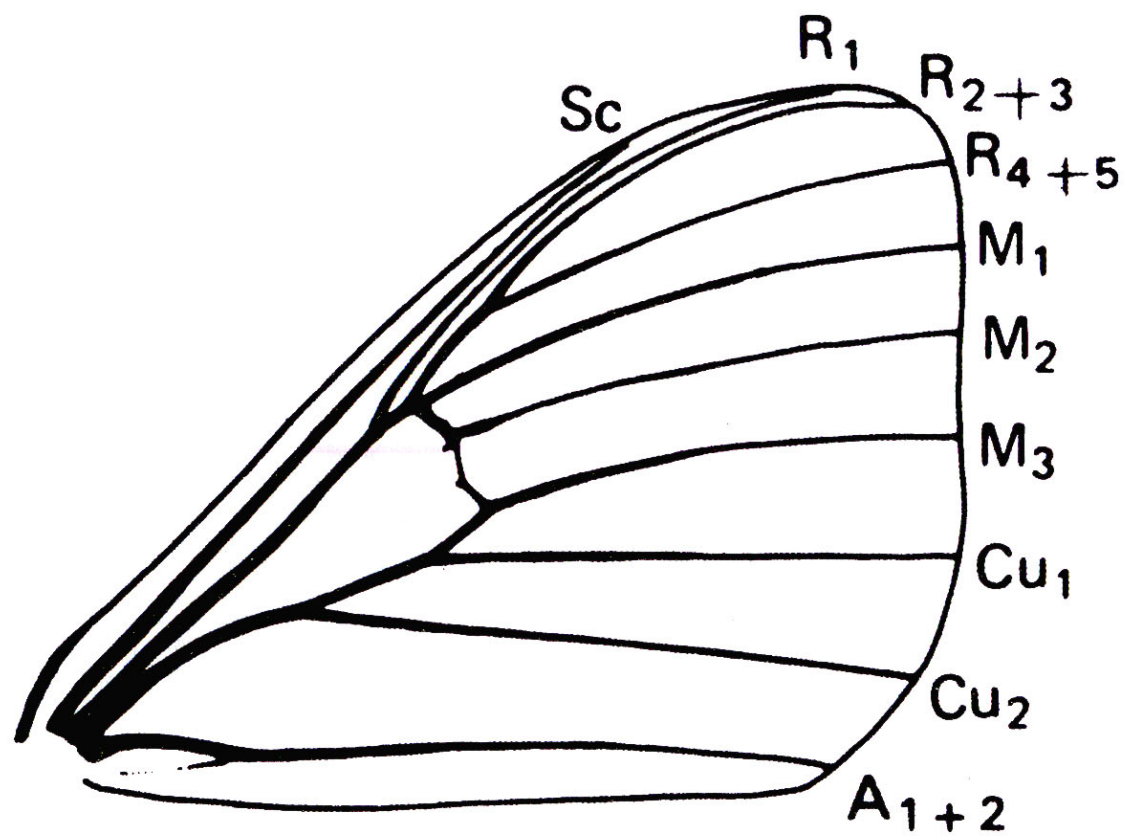
Sandra R. Schachat^{1,2*} and Richard L. Brown¹



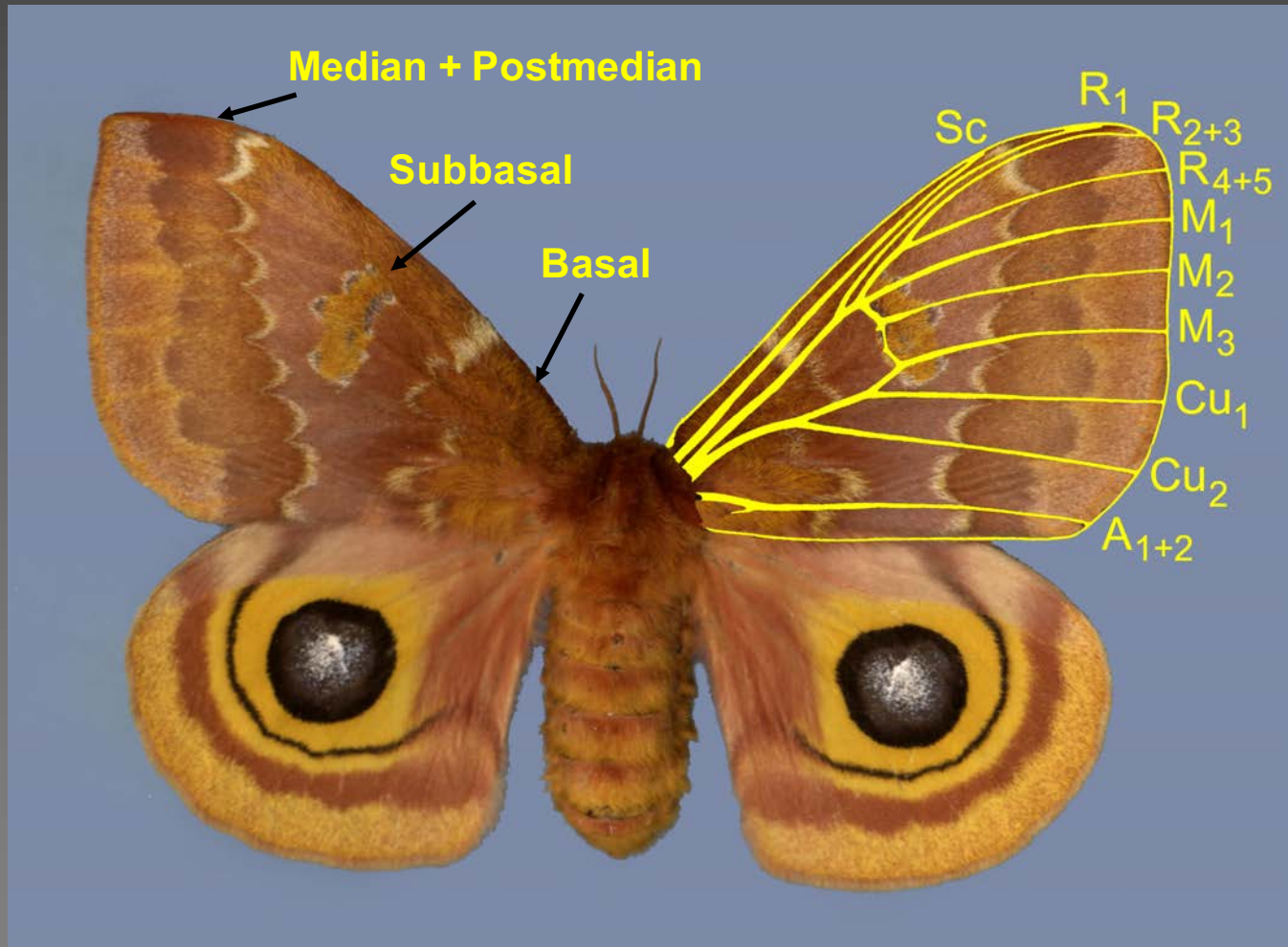


Can pattern elements of Tortricidae be homologized with other Lepidoptera?









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